IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended) A waveform generation method ~~comprising: for a desired target waveform output~~ for outputting from a D/A converter [[,]] an output waveform matching a target waveform, comprising:

~~determining preliminarily an output values and an output timing of the D/A converter, including~~ varying output values of the D/A converter to match values of the target waveform and varying output timings to match respective output values of the D/A converter with matched values of the target waveform ~~so that a voltage variation amount of the target waveform may be almost constant~~; and ~~sequentially~~

generating the output ~~value~~ waveform from the D/A converter, based on the determined output values and output timings of the D/A converter.

Claim 2 (Currently Amended): The waveform generation method according to claim 1, further comprising:

filtering ~~interpolating~~ between the output values of the D/A converter ~~while~~ with a low pass filter ~~is~~ provided on an output side of the D/A converter.

Claim 3 (Currently Amended): A ~~program for generating a waveform employing data created in accordance with a procedure of (a) to (f) and stored in a time memory and a waveform memory, wherein the waveform is output in accordance with a waveform output processing procedure of (g) to (k)~~ method comprising:

generating waveform data, including

(a) approximating a target waveform v with at least one function f(t), ~~a plurality of functions f1(t), f2(t), f3(t), ...;~~

~~(b) calculating inverse functions of the plurality of functions f1(t), f2(t), f3(t), ..;~~

~~(c)~~ (b) acquiring times t1, t2, t3, ..tN corresponding to output ~~set-up~~ voltage values V1, V2, V3, .. [[, Vn]] VN of a D/A converter, and [[;]]

~~(d)~~ (c) replacing the times t1, t2, t3, .. tN with time differences T1, T2, T3, .. TN between ~~a current time and a previous time~~ sequential times t1, t2, t3, .. tN;

storing the waveform data, including

~~(e)~~ (d) storing the time differences T1, T2, T3, .. TN in the time memory, wherein an initial value T0 of the time differences is zero and stored at ~~an~~ a first address value, and ~~0000;~~

~~(f)~~ (e) storing ~~the output set-up voltage values V1, V2, V3, .. in the waveform memory, wherein~~ an initial output voltage value V0 of the waveform memory ~~is stored~~ at ~~an~~ a first address value; and ~~0000;~~

controlling output timing with the waveform data, including

~~(g)~~ (f) substituting an initial value ~~of zero~~ for a loop variable n, [[;]]

~~(h)~~ (g) reading [[a]] an n-th time data Tn from the time memory and setting the time data Tn in a ~~predetermined~~ timer, [[;]]

~~(i)~~ (h) initiating and counting the timer, [[;]]

~~(j)~~ (i) accepting a count end notification from the timer, ~~reading a n-th waveform data from the waveform memory,~~ and setting the output ~~set-up~~ voltage value Vn in the D/A converter, [[;]] and

~~(k)~~ (j) ~~determining a completion status of a waveform output process by confirming the loop variable n, and~~ repeating ~~a series of processing from~~ step ~~(h)~~ (g) to step ~~(j)~~ (j) ~~by counting up~~ until the loop variable n ~~until~~ indicates completion.

Claim 4 (Currently Amended): A waveform generation circuit comprising:

a time memory ~~for storing an~~ configured to store output time intervals of waveform output values preset discretely based on a ~~desired~~ target waveform, the waveform output values varying to match values of the target waveform, and the output time intervals varying to match respective waveform output values with matched values of the target waveform;

a timing controller ~~for setting up a timing~~ configured to set the times at which [[a]] D/A conversion of the waveform output values is performed, based on the corresponding output time intervals stored in the time memory; and

a D/A converter ~~for performing the~~ configured to perform D/A conversion of the waveform output values according to the ~~timing~~ times set ~~up~~ in the timing controller.

Claim 5 (Currently Amended): The waveform generation circuit according to claim 4, further comprising:

a low pass filter ~~for interpolating~~ configured to filter between output values of the D/A converter.

Claim 6 (Previously Presented): A radar apparatus comprising:

the waveform generation circuit according to claim 4 as a modulation circuit for modulating the oscillation frequency of an oscillator.

Claim 7 (Previously Presented): A radar apparatus comprising:

the waveform generation circuit according to claim 5 as a modulation circuit for modulating the oscillation frequency of an oscillator.

Claim 8 (New): The waveform generation method according to claim 1, further comprising:

determining the output timings on the basis of the intersection of the target waveform with plural threshold voltages.

Claim 9 (New): The waveform generation method according to Claim 8, further comprising:

determining the threshold voltages on the basis of a minimum resolution of the D/A converter.

Claim 10 (New): A signal comprising the waveform generated by the method of claim 1.

Claim 11 (New): A signal comprising the waveform generated by the method of claim 2.

Claim 12 (New): A signal comprising the waveform generated by the method of claim 8.

Claim 13 (New): A signal comprising the waveform generated by the method of claim 9.

Claim 14 (New): The method of claim 3, wherein the at least one function f(t) is linear.

Claim 15 (New): The method of claim 3, wherein at least some of the time differences T1, T2, T3, .. TN are different from one another.

Claim 16 (New): The method of claim 3, wherein the step (b) includes calculating an inverse of the at least one function f(t).

Claim 17 (New): A waveform generation method for outputting from a D/A converter a target waveform, comprising:

obtaining output values and corresponding output timings for an output waveform of the D/A converter, the output values varying to match values of the target waveform, and the output timings varying to match respective output values with matched values of the target waveform; and

generating the output waveform of the D/A converter, based on the output values and output timings of the D/A converter.

Claim 18 (New): The waveform generation method according to claim 17, further comprising:

generating the output timings on the basis of the intersection of the target waveform with plural threshold voltages.

Claim 19 (New): The waveform generation method according to Claim 18, further comprising:

determining the threshold voltages on the basis of a minimum resolution of the D/A converter.

Claim 20 (New): A radar device for generating a high frequency signal modulated so as to increase and decrease a change of an oscillation frequency linearly with respect to time, and for transmitting a transmission electronic wave, the radar device comprising:

a time memory;

a waveform memory;

a D/A converter;

an oscillator for generating the modulated high frequency signal based on an output voltage waveform of the D/A converter; and

a microcomputer having stored therein a program to generate a waveform from data previously created and stored in the time memory and the waveform memory according to steps (a) to (f), wherein the microcomputer is configured to cause the waveform to be output in accordance with waveform output processing functions (g) to (k);

(a) approximating a target waveform v with a plurality of functions f1(t), f2(t), f3(t), ...;

(b) calculating inverse functions of the plurality of functions f1(t), f2(t), f3(t), ...;

(c) acquiring times t1, t2, t3, ... tN corresponding to output set-up voltage values V1, V2, V3, ..., Vn of a D/A converter;

(d) replacing the times t1, t2, t3, ... tN with time differences T1, T2, T3, ... TN between a current time and a previous time;

(e) storing the time differences T1, T2, T3, ... TN in the time memory, wherein an initial value T0 of the time difference is zero and stored at an initial address;

(f) storing the output set-up voltage values V1, V2, V3, ... in the waveform memory, wherein an initial value V0 of the waveform memory is stored at an initial address;

(g) substitute an initial value of zero for a loop variable n;

(h) read an n-th time data Tn from the time memory and setting the time data Tn in a predetermined timer;

(i) initiate and count the timer;

(j) accept a count end notification from the timer, read an n-th waveform data from the waveform memory, and set the output set-up voltage value Vn in the D/A converter; and

(k) determine a completion status of a waveform output process by confirming the loop variable n, and repeating the processing procedure from (h) to (j) by counting up the loop variable n until completion.

Claim 21 (New): An FM-CW radar device that generates a high frequency signal modulated so as to increase and decrease time change of an oscillation frequency linearly with respect to time, and transmits a transmission electronic wave, the FM-CW radar device comprising:

a time memory;

a D/A converter for performing D/A conversion based on an output set-up voltage;

a microcomputer configured to control an output timing of each output set-up voltage of the D/A converter in accordance with functions (a) to (c) employing time data that are discretely stored in the time memory so that the D/A converter outputs a desired output voltage waveform; and

an oscillator for generating the modulated high frequency signal based on the output voltage waveform of the D/A converter;

wherein the time memory stores time differences of each output time in accordance with each output set-up voltage as the time data, according to integral multiples of minimum quantized voltage, using an approximate function of the desired output voltage waveform,

and wherein the each output time corresponds to integral multiples of a clock unit in the microcomputer, and

the microcomputer is further configured to

(a) sequentially read the time data in the time memory, and starting to count an elapsed time when the time data is read,

(b) set the output set-up voltage to the D/A converter when the elapsed time counted at the step of (a) reaches the time data, and

(c) repeat functions (a) and (b) for predetermined times.

Claim 22 (New): An FM-CW radar device for generating a high frequency signal modulated so as to increase and decrease a change of an oscillation frequency linearly with respect to time, and for transmitting a transmission electronic wave, the FM-CW radar device comprising:

a D/A converter;

a time memory configured to store each output time interval of each waveform output value preset discretely according to a voltage step of a minimum resolution of the D/A converter based on a desired target waveform, which is used in FM-CW modulation;

a timing controller configured to set up a timing at which a D/A conversion of the waveform output values is performed by the D/A converter, based on each output time interval stored in the time memory;

a low pass filter configured to interpolate between output values of the D/A converter; and

an oscillator configured to oscillate the modulated high frequency signal based on the output voltage waveform of the D/A converter.

Claim 23 (New): An FM-CW radar device for generating a high frequency signal modulated so as to increase and decrease a time change of an oscillation frequency linearly, and for transmitting a transmission electronic wave, the FM-CW radar device comprising:

a D/A converter configured to perform a D/A conversion based on an output set-up voltage;

a time memory configured to store each output time interval of each output set-up voltage preset discretely according to integral multiples of a minimum quantized voltage of the D/A converter to output a desired target waveform, which is used in the FM-CW modulation;

a timing controller configured to set up a timing at which a D/A conversion of the output set-up voltage is performed by the D/A converter, based on each output time interval stored in the time memory;

a low pass filter configured to smooth the output waveform of the D/A converter; and

an oscillator configured to oscillate the modulated high frequency signal based on output voltage waveform of the D/A converter.

Claim 24 (New): The method according to claim 3, wherein the step of (a) approximating further comprises:

approximating the target waveform v with a plurality of functions.

Claim 25 (New): The method according to claim 3, wherein the step of (e) storing further comprises:

storing the output voltage values V1, V2, V3, .. VN in the waveform memory.

Claim 26 (New): The method according to claim 25, wherein the step of (i) accepting further comprises:

reading an n-th waveform data from the waveform memory.